

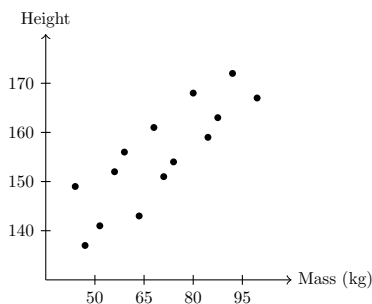
Foundation GCSE: Scatter Graphs

Name: _____

Class: _____

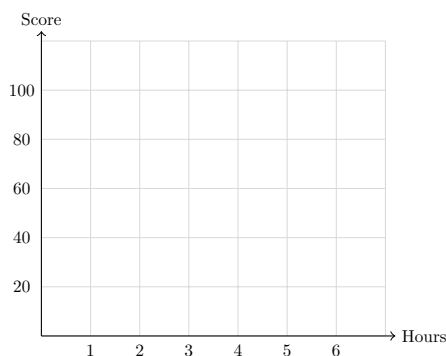
Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (10). Working out and drawn lines of best fit should be shown where appropriate.

1. The scatter graph below shows the mass (in kg) and height (in cm) of 14 students. State the height of the student who has a mass of 50 kg.

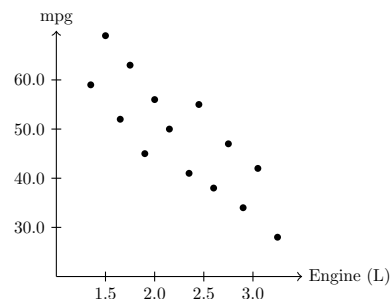


2. Explain why a line of best fit should be a single straight line rather than connecting all the points with dot-to-dot line segments.
3. Plot the given data points for revision hours (x) and exam score (y) on the grid below, then draw a line of best fit:

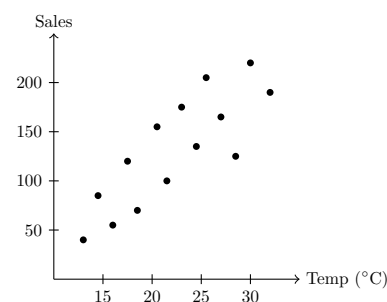
(0.8, 1.3), (1.3, 0.9), (1.6, 2.4), (2.0, 1.5),
 (2.4, 3.1), (2.8, 2.0), (3.1, 3.8), (3.5, 2.5),
 (3.9, 4.2), (4.2, 3.0), (4.7, 4.6), (5.1, 3.4),
 (5.5, 4.9), (6.1, 4.3)



4. Using your line of best fit from Question 3, estimate the exam score for a student who revises for 3.5 hours.
5. The scatter graph below records car engine size (litres) and fuel efficiency (mpg) for 14 different cars. Draw a line of best fit on the graph.



6. Using the trend shown in Question 5, estimate the fuel efficiency (mpg) for an engine size of 2.2 litres.
7. Explain why it can be unreliable to use a line of best fit to estimate values that lie well outside the range of the given data.
8. State what type of correlation is shown when two variables increase together, and sketch a quick example of what the points would look like.
9. The scatter graph below records weekly temperature and ice cream sales over 14 weeks. Draw a line of best fit and state the type of correlation shown.



10. A line of best fit passes through the points (2, 15) and (6, 47). Calculate the gradient of this line to determine the expected increase in the dependent variable per unit increase in the independent variable.

Answers & Worked Solutions

1. 160 cm (corresponding to mass index point 2, i.e., 50 kg).
2. To show the overall underlying trend while smoothing out individual random variations or anomalies.
3. Points plotted correctly for all given coordinate pairs with a ruled line passing through the general centre of mass of the points.
4. Approximately 57 to 59 marks (depending on the drawn line of best fit).
5. A straight line drawn with a negative gradient through the descending scatter points.
6. Approximately 32 to 34 mpg (read from the line at 2.2L).
7. Because we cannot assume the relationship continues in the exact same linear pattern beyond the collected data (extrapolation risk).
8. Positive correlation (points slope upwards from bottom-left to top-right).
9. Positive correlation (as temperature increases, ice cream sales increase).
10. 8
$$\left(\frac{47 - 15}{6 - 2} = \frac{32}{4} \right)$$